

Montana Department of Environmental Quality - Thompson River Co-Gen, LLC, Permit #3175-03



Permit #3175-03 Modification Presentation

- Applicable Permit History
- Boiler Oxides of Nitrogen (NO_x) Emissions
- Boiler Sulfur Dioxide (SO₂) Emissions
- Other Permit Modifications
- Thompson Falls Area Ambient Air Quality Impact Analysis

Permit History – Comparison

* Permit #3175-02 was an administrative action

Applicable Permit Term	Permit #3175-00	Permit #3175-01	Permit #3175-03
PM ₁₀ Emission Limit/Control	0.017 gr/dscf	0.017 gr/dscf	0.017 gr/dscf
NO _x Emission Limit/Control	0.220 lb/MMBtu	0.178 lb/MMBtu	0.178 lb/MMBtu
SO ₂ Emission Limit/Control	0.300 lb/MMBtu	0.220 lb/MMBtu	0.206 lb/MMBtu
CO Emission Limit/Control	0.320 lb/MMBtu	0.259 lb/MMBtu	0.259 lb/MMBtu
VOC Emission Limit/Control	0.038 lb/MMBtu	0.0308 lb/MMBtu	0.0308 lb/MMBtu

Boiler Oxides of Nitrogen (NOx) Emissions

Applicable Permit Term	Existing Permit Term	TRC Proposed Permit Term	Draft Permit Term
NOx BACT Emission Limits	0.178 lb/MMBtu (1-hr average)	0.28 lb/MMBtu (30-day rolling average)	0.178 lb/MMBtu (3-hr average)
Short-Term NOx Emission Limits	34.32 lb/hour (1-hr average)	195 lb/hour (1-hr average)	47.24 lb/hr (1-hr average)
NOx BACT Control Strategy	Combustion Control (CC): Over-Fire Air (OFA)	CC/OFA	Selective Non-Catalytic Reduction Unit (SNCR) and CC/OFA

Boiler Sulfur Dioxide (SO₂) Emissions

Applicable Permit Term	Existing Permit Term	TRC Proposed Permit Term	Draft Permit Term
SO₂ BACT Emission Limits	0.220 lb/MMBtu (1-hr average)	0.275 lb/MMBtu (30-day rolling average)	0.206 lb/MMBtu (30-day rolling average)
SO₂ Short-Term Emission Limits	42.42 lb/hr (1-hr average)	155 lb/hr (1-hr average)	72.30 lb/hr (1-hr average)
SO₂ Percent Reduction	90%	Remove Term	Remove Term
SO₂ BACT Control Strategy	Dry-Lime Scrubber (Specific FGD)	Flue Gas Desulfurization Unit (FGD)	FGD
SO₂ Monitoring Strategy	Periodic Source Testing	Periodic Source Testing	SO ₂ CEMS

Other Permit Modifications

Applicable Permit Term	Existing Permit Term	TRC Proposed Permit Term	Draft Permit Term
Boiler Heat Input Limit	192.8 MMBtu/hr (1-hr avg.) and 1,688,928 MMBtu/year (rolling 12-month avg.)	1,688,928 MMBtu/year (rolling 12-month avg.)	192.8 MMBtu/hr (3-hr avg.) and 1,688,928 MMBtu/year (rolling 12-month avg.)
Boiler Steam Production Limit	130,000 lb steam/hr	Remove Limit	Remove Limit
Boiler Baghouse Air-Flow Limit	40,513 dscfm	Remove Limit	Remove Limit

Additional Slides

- Modeled Ambient Air Quality Impacts

NAAQS/MAAQs Compliance Demonstration

Pollutant	Avg. Period	Modeled Conc. ^a ($\mu\text{g}/\text{m}^3$)	Total (w/bkgd) ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	% of NAAQS	MAAQs ($\mu\text{g}/\text{m}^3$)	% of MAAQs
PM ₁₀	24-hr	106 ^b	136	150	91	150	91
	Annual	31.3 ^b	39.3	50	79	50	79
NO ₂	1-hr	214 ^c	289	-----	-----	564	51
	Annual	3.4 ^d	9.4	100	9.4	94	10
SO ₂	1-hr	433	468	-----	-----	1,300	36
	3-hr	180	206	1,300	16	-----	-----
	24-hr	73	84	365	23	262	32
	Annual	5.1	8.1	80	10	52	16

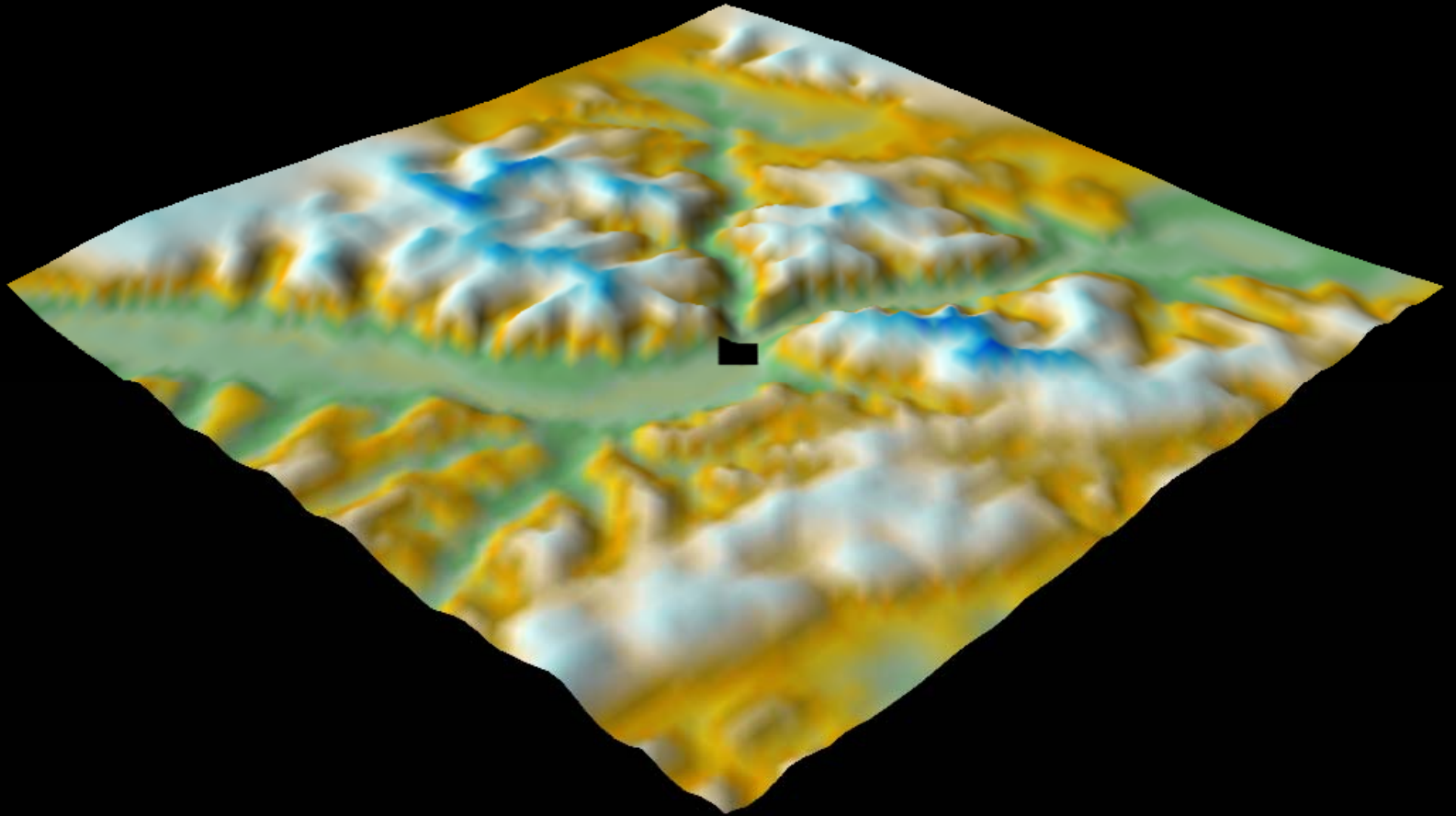
^a Concentrations are high-second high values except annual averages.

^b Includes TRC and TRL impacts (from Rev. 7, July 30, 2004).

^c The ozone limiting method has been applied to this result.

^d The ambient ratio method has been applied to this result.

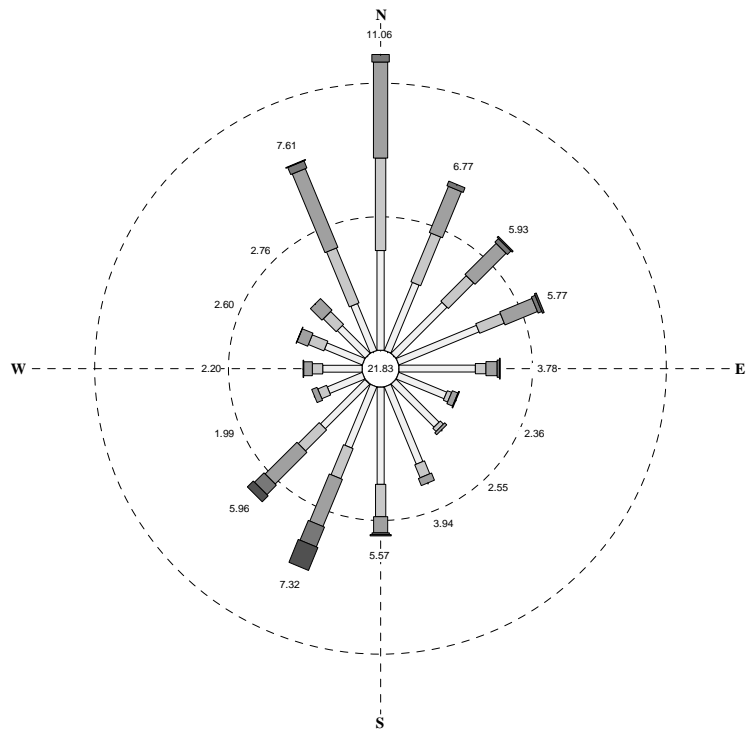
TRC Modeling Domain Topography



Details of Modeling

- Objective: to predict the worst-case impacts
- Model uses wind speed, direction, temperature and cloud cover
- Modeled 10 years of Meteorological Data, 88,000 hours of data
- Data from Missoula and Kalispell

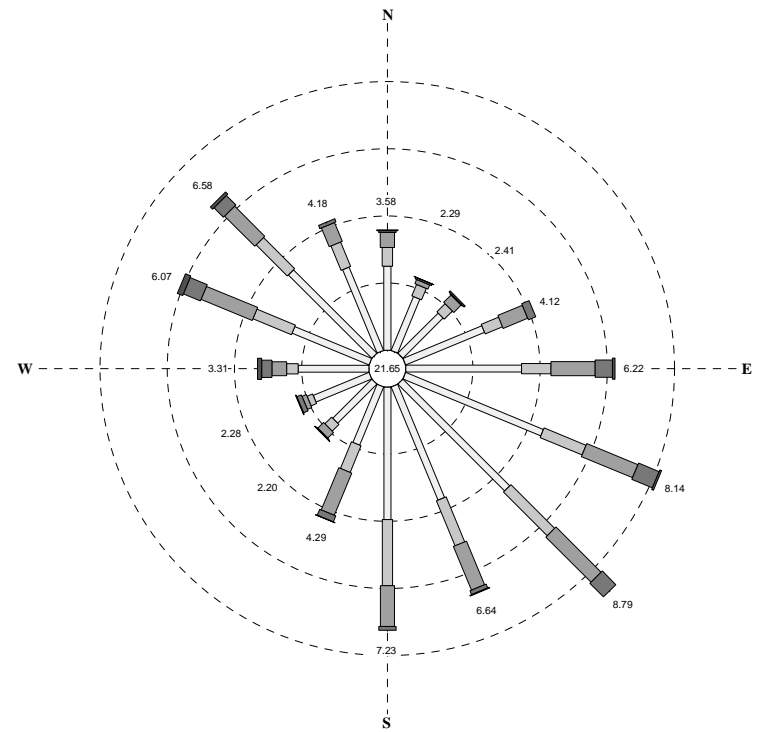
Joint Frequency Distribution (Wind Rose)
Kalispell 1990



Wind Speed (Meters Per Second)

Calms included at center.
Rings drawn at 5% intervals.
Wind flow is FROM the directions shown.
No observations were missing.

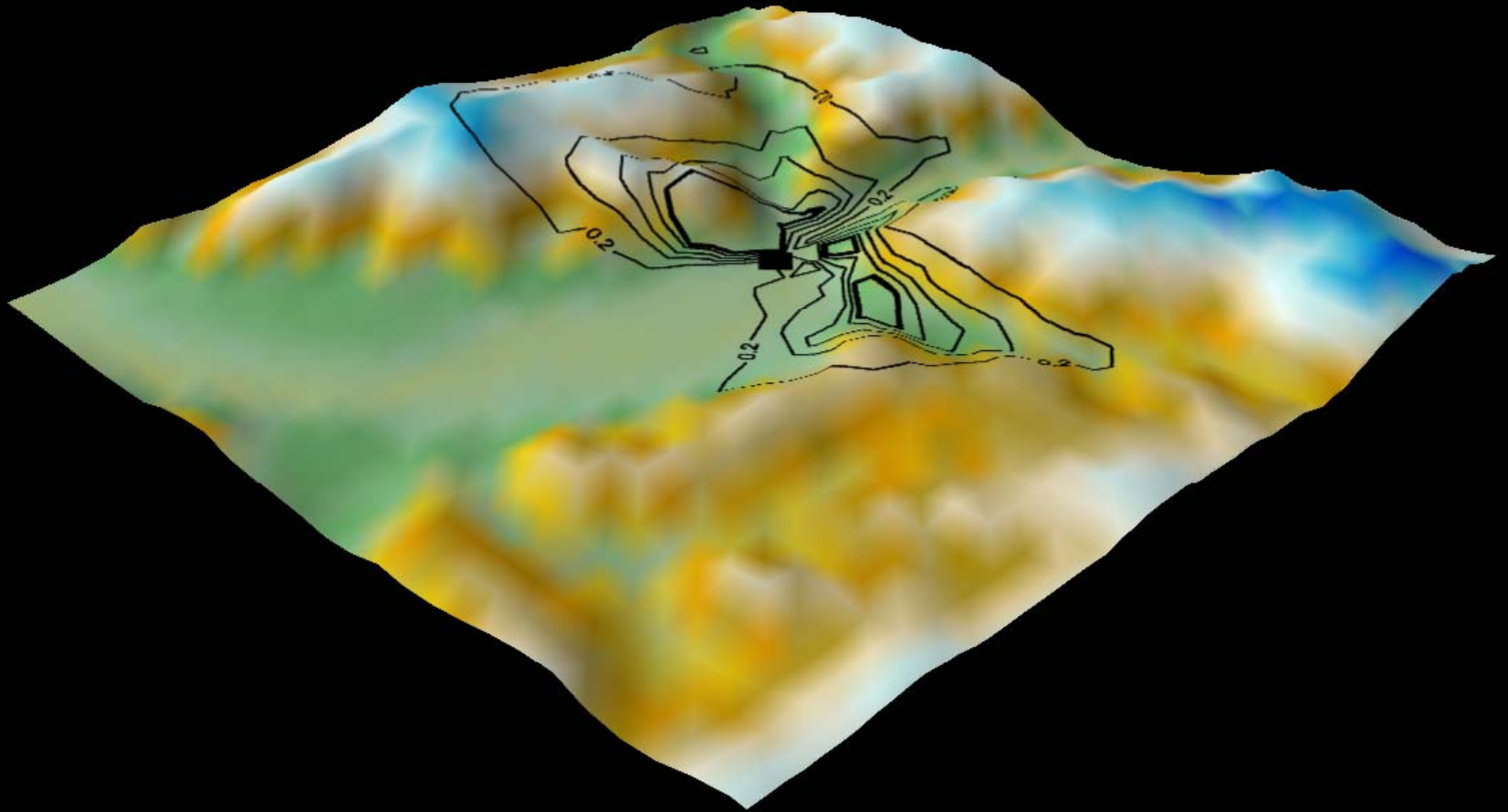
Joint Frequency Distribution (Wind Rose)
Missoula 1990

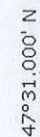


Wind Speed (Meters Per Second)

Calms included at center.
Rings drawn at 2% intervals.
Wind flow is FROM the directions shown.
No observations were missing.

**TRC Modeling Domain Showing
Modeled Annual SO₂ Impacts**







Public Comment Permit #3175-03

- Written comments must be received by **March 13, 2006**
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